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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/832,171	04/10/2001	Hitoshi Ota	U 013390-0	8787

7390

07/19/2002

Ladas & Parry
26 West 61 Street
New York, NY 10023

EXAMINER

SHOSHO. CALLIE E

ART UNIT

PAPER NUMBER

1714

DATE MAILED: 07/19/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/832,171

Applicant(s)

OTA ET AL.

Examiner

Callie E. Shosho

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/21/01.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5-6. 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on 4/10/200 and 4/6/2001. It is noted, however, that applicant has not filed a certified copy of either Japanese application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites an improper Markush group. It is suggested that in line 9 after “-NH₃” and before “-NR₃”, the word “and” is inserted.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-4, 7, 9-14, 17, and 21-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujimatsu et al. (U.S. 5,913,971) taken in view of the evidence in Ueda et al. (U.S. 5,968,244).

Fujimatsu et al. disclose method of making pigment dispersion wherein the dispersion step comprises dispersing acidic carbon black which is mixed with wetting agent such as glycol ether, water, and alkali-soluble resin which is styrene-acrylic acid copolymer that has acid number of 95-130 and molecular weight of 2,000-8,000. It is well known, as found in Ueda et al. (col.3, lines 23-30), that acidic carbon black has carboxyl groups on its surface and is produced by surface modifying carbon black. There is also disclosed an ink jet ink comprising the above dispersion wherein the ink has surface tension of 25-60 dyne/cm (i.e. mN/m) and is printed onto recording medium using drop-on-demand printers which energize the ink by dynamic or thermal energy in order to eject ink from printer and produce printed image (col.2, lines 45-52 and 65-67, col.3, lines 6 and 61-62, col.4, lines 16-21 and 57-60, col.6, lines 15-30, 50-51, and 55-61, and example 2).

From example 2, for instance, it is calculated that the dispersion comprises approximately 6.7% pigment and ratio of resin to pigment of 0.75/1.

Further, although there is no disclosure of glass transition temperature of the styrene-acrylic copolymer, given that the glass transition temperature of styrene is 100 °C and the glass transition temperature of acrylic acid is 105 °C, it is clear that glass transition temperature of styrene-acrylic copolymer will always be greater than 50 °C as required in the present claims.

In light of the above, it is clear that Fujimatsu et al. anticipate the present claims.

6. Claims 1-14, 17, and 21-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Parazak (U.S. 6,281,267).

Parazak disclose process for preparing pigment dispersion which comprises a pigment surface treatment step of introducing at least one hydrophilic group onto surface of pigment and then dispersing the pigment by dispersing pigment in mixture with wetting agent, water, and polymer wherein the wetting agent includes acetylene glycol identical to that presently claimed. The polymer includes styrene-acrylic acid copolymer that has acid number of 80-200 and molecular weight of 1,000-20,000. The hydrophilic groups present on the pigment include sulfonic acid, carboxylic acid, phosphonic acid, and ammonium. There is also disclosed an ink jet ink comprising the above dispersion wherein the ink is printed onto recording medium using piezoelectric ink jet ink printer or thermal ink jet ink printer which energize the ink by dynamic or thermal energy, respectively, in order to eject ink from printer and produce printed image (col.3, lines 39-66, col.4, lines 1, 35, and 37-40, col.5, lines 4-7, col.6, line 61-col.7, line 10, col.8, line 35, and col.9, lines 16-18).

From example 1, for instance, it is seen that the dispersion comprises approximately 3% pigment, ratio of resin to pigment of 1/3, and ratio of acetylene glycol to pigment of 1/20.

Further, although there is no disclosure of glass transition temperature of the styrene-acrylic copolymer, given that the glass transition temperature of styrene is 100 °C and the glass transition temperature of acrylic acid is 105 °C, it is clear that glass transition temperature of styrene-acrylic copolymer will always be greater than 50 °C as required in the present claims.

Although there is no disclosure of the surface tension of the dispersion, given that Parazak disclose dispersion identical to that presently claimed including same type and amount

of wetting agent, pigment, and resin, it is clear that the dispersion would also inherently possess surface tension as presently claimed.

In light of the above, it is clear that Parazak anticipate the present claims.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimatsu et al. (U.S. 5,913,971) in view of either Yatake et al. (U.S. 6,051,057) or Osumi et al. (U.S. 5,976,233).

The disclosure with respect to Fujimatsu et al. in paragraph 5 above is incorporated here by reference.

The difference between Fujimatsu et al. and the present claimed invention is the requirement in the claims of acetylene glycol.

Yatake et al., which is drawn to ink jet ink comprising self-dispersing pigment, disclose the use of acetylene glycol surfactant identical to that presently claimed in order to prevent foaming in the ink (col.2, lines 20-43 and col.4, lines 5-13). Further, Yatake et al. disclose the equivalence and interchangeability of acetylene glycol and polyoxyethylene alkyl ether as disclosed by Fujimatsu et al. (col.5, lines 66-67).

Alternatively, Osumi et al., which is drawn to ink jet ink comprising self-dispersing pigment, disclose the use of acetylene glycol surfactant identical to that presently claimed in order to improve ejection stability and fixing ability of the ink (col.6, lines 5-10 and 29-43). Further, Osumi et al. disclose the equivalence and interchangeability of acetylene glycol and polyoxyethylene alkyl ether as disclosed by Fujimatsu et al. (col.5, lines 66-67).

In light of the motivation for using acetylene glycol disclosed by either Yatake et al. or Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in

the art to use acetylene glycol in Fujimatsu et al. in order to prevent foaming in the ink, or alternatively, improve ejection stability and fixing ability of the ink, and thereby arrive at the claimed invention.

10. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimatsu et al. (U.S. 5,913,971) or Parazak (U.S. 6,281,267) either of which in view of Ichizawa et al. (U.S. 6,368,397).

The disclosures with respect to Fujimatsu et al. and Parazak in paragraphs 5 and 6, respectively, are incorporated here by reference.

The difference between either Fujimatsu et al. or Parazak and the present claimed invention is the requirement in the claims regarding the amount of polyvalent metal ion present.

Ichizawa et al., which is drawn to ink jet ink, disclose limiting the amount of impurities, i.e. polyvalent metal ions, present in the ink to less than 500 ppm so that nozzle clogging does not occur (col.7, lines 58-65).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control amount of polyvalent metal ions in either Fujimatsu et al. or Parazak to less than 500 ppm in order to produce ink which will not clog printer nozzles, and thereby arrive at the claimed invention.

11. Claims 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Parazak (U.S. 6,281,267) in view of Johnson et al. (U.S. 6,336,965).

The disclosure with respect to Parazak in paragraph 6 above is incorporated here by reference.

The difference between Parazak and the present claimed invention is the requirement in the claims of specific type of pigment.

Johnson et al, which is drawn to surface modified pigment, disclose the equivalence and interchangeability of black pigment, i.e. carbon black, as explicitly disclosed by Parazak et al., with other colored pigments including Pigment Red, Pigment, Blue, and Pigment Yellow selected from class of pigments such as quinacridones, phthalocyanines, and anthraquinones (col. 6, lines 23-56).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use different colored pigments in the ink of Parazak in order to produce ink with desired color, and thereby arrive at the claimed invention.

12. Claims 1-8, 10, 12-13, 17, 21-23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satake et al. (U.S. 5,814,685) in view of Osumi et al. (U.S. 5,976,233).

Satake et al. disclose method of making pigment dispersion wherein the dispersion step comprises dispersing pigment which is mixed with wetting agent, i.e. surfactant, and water, followed by the addition of alkali-soluble resin that has acid number of 50-250 and molecular weight of 3,000-20,000. There is also disclosed an ink jet ink comprising the above dispersion wherein the ink has surface tension of 25-60 dyne/cm (i.e. mN/m) and is printed onto recording medium using ink jet printers to produce printed image (col.4, lines 62-65, col.5, lines 1-4, col.6, lines 15-16, col.7, lines 66-67, col.8, lines 25-36 and 48-49, and col.9, line 58-col.10, line 6).

From example 1, for instance, it is seen that the dispersion comprises 20% pigment and ratio of nonionic surfactant to pigment of 1:4

The difference between Satake et al. and the present claimed invention is the requirement in the claims of (a) specific type of pigment and (b) acetylene glycol.

With respect to difference (a), Satake et al. disclose that the pigments include surface treated pigment having functionalized surface (col.6, lines 15-16).

Osumi et al., which is drawn to ink jet ink, disclose the use of pigment with hydrophilic group on its surface such as $-\text{COOM}$, $-\text{SO}_3\text{M}$, $-\text{PO}_3\text{HM}$, $-\text{SO}_2\text{NHCOR}$, $-\text{NH}_3$, and NR_3 where M is hydrogen, alkali metal, or ammonium. The motivation for using such pigment is that they have good dispersability in water and produce ink with good storage stability (col.3, lines 35-54, col.4, line 6, and col.4, line 61-col.5, line 4).

In light of the motivation for using specific type of pigment disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in Satake et al. in order to produce an ink good storage stability, and thereby arrive at the claimed invention.

With respect to difference (b), Satake et al. disclose the use of wetting agent such as nonionic surfactant including polyoxyalkylene glycol, but there is no disclosure of acetylene glycol as presently claimed.

Osumi et al. disclose the use of acetylene glycol surfactant identical to that presently claimed in order to improve ejection stability and fixing ability of the ink (col.6, lines 5-10 and 29-43). Further, Osumi et al. disclose the equivalence and interchangeability of acetylene glycol and polyoxyethylene alkyl ether as disclosed by Satake et al. (col.8, lines 10-11).

In light of the motivation for using acetylene glycol disclosed by Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use acetylene glycol in Satake et al. in order to produce ink with improved ejection stability and fixing ability of the ink, and thereby arrive at the claimed invention.

13. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satake et al. in view of Osumi et al. as applied to claims 1-8, 10, 12-13, 17, 21-23, and 26 above, and further in view of Ichizawa et al. (U.S. 6,368,397).

The difference between Satake et al. in view of Osumi et al. and the present claimed invention is the requirement in the claims regarding the amount of polyvalent metal ion present.

Ichizawa et al., which is drawn to ink jet ink, disclose limiting the amount of impurities, i.e. polyvalent metal ions, present in the ink to less than 500 ppm so that nozzle clogging does not occur (col.7, lines 58-65).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control amount of polyvalent metal ions in Satake et al. to less than 500 ppm in order to produce ink that will not clog printer nozzles, and thereby arrive at the claimed invention.

14. Claims 1-3, 7-8, 10, 12-13, 17-23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satake et al. (U.S. 5,814,685) in view of Johnson et al. (U.S. 6,336,965).

Satake et al. disclose method of making pigment dispersion wherein the dispersion step comprises dispersing pigment which is mixed with wetting agent, i.e. surfactant, and water, followed by the addition of alkali-soluble resin that has acid number of 50-250 and molecular

weight of 3,000-20,000. There is also disclosed an ink jet ink comprising the above dispersion wherein the ink has surface tension of 25-60 dyne/cm (i.e. mN/m) and is printed onto recording medium using ink jet printers to produce printed image (col.4, lines 62-65, col.5, lines 1-4, col.6, lines 15-16, col.7, lines 66-67, col.8, lines 25-36 and 48-49, and col.9, line 58-col.10, line 6).

From example 1, for instance, it is seen that the dispersion comprises 20% pigment and ratio of nonionic surfactant to pigment of 1:4

The difference between Satake et al. and the present claimed invention is the requirement in the claims of specific type of pigment.

Satake et al. disclose that the pigments include surface treated pigment having functionalized surface (col.6, lines 15-16).

Johnson et al. disclose the use of pigment surface treated to attach polymer comprising functional groups such as -OR, -COOR, -SO₃H, and -PO₃H to the surface wherein the pigments include carbon black and colored pigments such as Pigment Red, Pigment, Blue, and Pigment Yellow selected from class of pigments such as quinacridones, phthalocyanine, and anthraquinone (col.4, lines 9-24, col.4, line 66-col.5, line 27, and col. 6, lines 23-56). The motivation for using such pigment is that the pigment has improved dispersability and dispersion stability (col.1, lines 52-55).

In light of the motivation for using specific type of pigment disclosed by Johnson et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such pigment in Satake et al., and thereby arrive at the claimed invention.

15. Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satake et al. in view of Johnson et al. as applied to claims 1-3, 7-8, 10, 12-13, 17-23, and 26 above, and further in view of either Yatake et al. (U.S. 6,051,057) or Osumi et al. (U.S. 5,976,233).

The difference between Satake et al. in view of Johnson et al. and the present claimed invention is the requirement in the claims of acetylene glycol.

Yatake et al., which is drawn to ink jet ink comprising self-dispersing pigment, disclose the use of acetylene glycol surfactant identical to that presently claimed in order to prevent foaming in the ink (col.2, lines 20-43 and col.4, lines 5-13). Further, Yatake et al. disclose the equivalence and interchangeability of acetylene glycol and polyoxyethylene alkyl ether as disclosed by Fujimatsu et al. (col.5, lines 66-67).

Alternatively, Osumi et al., which is drawn to ink jet ink comprising self-dispersing pigment, disclose the use of acetylene glycol surfactant identical to that presently claimed in order to improve ejection stability and fixing ability of the ink (col.6, lines 5-10 and 29-43). Further, Osumi et al. disclose the equivalence and interchangeability of acetylene glycol and polyoxyethylene alkyl ether as disclosed by Satake et al. (col.8, lines 10-11).

In light of the motivation for using acetylene glycol disclosed by either Yatake et al. or Osumi et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use acetylene glycol in Satake et al. in order to prevent foaming in the ink, or alternatively, improve ejection stability and fixing ability of the ink, and thereby arrive at the claimed invention.

16. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satake et al. in view of Johnson et al. as applied to claims 1-3, 7-8, 10, 12-13, 17-23, and 26 above, and further in view of Ichizawa et al. (U.S. 6,368,397).

The difference between Satake et al. in view of Johnson et al. and the present claimed invention is the requirement in the claims regarding the amount of polyvalent metal ion present.

Ichizawa et al., which is drawn to ink jet ink, disclose limiting the amount of impurities, i.e. polyvalent metal ions, present in the ink to less than 500 ppm so that nozzle clogging does not occur (col.7, lines 58-65).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control amount of polyvalent metal ions in Satake et al. to less than 500 ppm in order to produce ink that will not clog printer nozzles, and thereby arrive at the claimed invention.

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Takada et al. (U.S. 6,221,141) disclose ink jet ink comprising self-dispersing pigment and acetylene alcohol, however, there is no disclosure of resin as presently claimed.

Stubbe et al. (U.S. 6,171,382) disclose method of making pigment dispersion, however, there is no disclosure of surface treating the pigment.

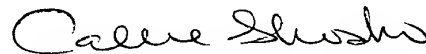
Moffatt et al. (U.S. 6,323,257) disclose ink jet ink comprising pigment having attached functional groups and polymer.

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18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Callie E. Shosho
Examiner
Art Unit 1714

CS
July 11, 2002